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Q. E. D.

2. To find the angle D P x (= arc Y.)

Having already tang. N P = ſine C P x × tang. P C, in the triangle N P Z are given N P and P Z to find the angle N P Z, or its complement D P x, the angle required.

Rad : tang. N P (= ſine C P x × tang. P C) : : Cotang. P Z (= tang. P Y) : coſine N P Z (= ſine D P x.) Therefore ſine D P x = ſine C P x × tang. P C × tang. P Y. And by uſing the logiſtic logarithms of the angles D P x, and C P x, and the complements of the tangents P C and P Y, we have this formula. L. log. of half the difference of errors in parts of a circle = L. log. of $\frac{1}{2}$ ſum of the errors in parts of a circle + log. tang. of ſtar's declination + log. cotang. of the lat. of the place.

Q. E. D.

N. B. If the clock goes at a different rate from that mentioned in the foregoing examples, proper allowance muſt be made in determining the angles, from the times of obſervation.

November, 1786.

Remarks on an Eclipſe of the Moon ſeen at Jeruſalem, not long before the death of Herod, and mentioned by Joſephus. By JAMES WINTHROP, Eſq. A.A.S.

THE eclipſe, which is the ſubject of the preſent paper, is of great importance in chronology, as it ſerves to aſcertain the true point of time from which the Chriſtian æra ought to be be dated. Joſephus having given an account (B. xvii. ch. 6. § 4. Antiq.) of a number of ſtudents in the temple, with their preceptors Judas and Matthias being arreſted for taking down an eagle, which Herod had placed in the front of the temple, and which they were induced to remove by a report of Herod's death, ſays, " But Herod deprived this Matthias of the high prieſthood; and burnt the other Matthias, who had raiſed the ſedition, with his companions, alive. And that very night there was an eclipſe of the moon." Herod had then been ſick the greater part of a year, and his diſorder had increaſed to ſuch a degree as to produce frequent faintings, which occaſioned reports of his actual death. But he appears really to have died ſome time in March. This eclipſe was then in the laſt winter of his life, and as Chriſt was born before the death of Herod, and ſometime in the fall of the year, it was in the firſt winter of his life.

Mr. Whiſton, in a note upon this paſſage, ſays that it is the only eclipſe mentioned by Joſephus, and " is of the greateſt conſequence for the determination of the time of the death of Herod and Antipater; and for the birth and entire chronology of Jeſus Chriſt. It happened March 13th, in the year of the Julian period 4710, and the 4th before the Chriſtian æra."

Nobody will doubt either the diſpoſition or ſkill of Mr. Whiſton to make the beſt uſe of his materials. But though he lived, when aſtronomy, aided by Sir Iſaac Newton, Meſſrs. Flamſtead, Halley, Whiſton and their cotemporaries, was aſſuming a more accurate form, than it ever had; yet neither their inſtruments, nor the length of time for which their obſervations had been continued, enabled them to fix ſuch ancient eclipſes with preciſion. The difficulty of verifying ancient dates by eclipſes was felt and acknowledged by all, who attempted it. But ſince the time of Dr. Halley, that great improver of the tables, the buſineſs has been growing more correct. The eclipſe now under conſideration is a proof of it. By the tables both of Profeſſor Mayer and Mr. Ferguſon, it appears that the full moon in December of the winter in which our common æra commences, was between five and ſix o'clock of the twenty-ninth day; and that the moon was only eight degrees from the node. As theſe two ſets of tables agreed ſo nearly, I aſcertained the other elements by Ferguſon, and find that the moon muſt have been eclipſed about eleven digits. As the ſun ſet that afternoon at Jeruſalem at five o'clock, the full moon being 22′ paſt five, the moon muſt have riſen largely eclipſed. This being only two days before the commencement of our vulgar æra, removes the objection to its being the true æra.

Mr. Whiſton's reputation ſeems to have miſled Mr. Ferguſon in his remarks on this eclipſe (Aſtr. p. 386, 8vo) and the latter either never calculated it by his own tables, or was too modeſt to ſet them up againſt ſuch an authority. Profeſſor Mayer's were publiſhed in 1770, which was ſome years after Mr. Ferguſon. If I have made a right uſe of the Profeſſor's book, he differs but a few minutes from Mr. Ferguſon in the mean full moon.

If any apology be neceſſary for calling the attention of the ſociety to a queſtion ſo long agitated, it will be found in a deſire to prove the accuracy of the New Teſtament hiſtory. Every thing that has this effect I truſt will be well received.

Cambridge, *January* 10, 1800.

Deſcription of a New INVENTED STEELYARD, *by* BENJAMIN DEARBORN, F.A.A.

Boſton, *May* 29, 1792.

SIR,

THE Steelyard ſent herewith was deſigned to correct the errors of fraud and accident, to which thoſe of the common kind are ever liable. By placing the centre of motion above the centre of gravity, and by bringing the points of ſuſpenſion upon a line with the centre of motion, the beam vibrates either with or without the article weighed, like a ſcalebeam, if balanced by equal weight of the ends. This prevents the deceptive appearance of an equipoiſe by dexterity of hand. Dexterity will no more affect this ſteelyard than a well adjuſted ſcalebeam. The reaſon will appear by the figure. The centre of motion in the *common ſteelyard* is D, Plat. I. fig. 4th. The points of ſuſpenſion C and E. While the beam is in a horizontal poſition, the points are at equal horizontal diſtances from the centre; but the moment this poſition is changed, one point recedes from, and the other approaches the centre in horizontal diſtance,